

LISTING OF THE CLAIMS

1-37. (Canceled)

38. (Currently amended) A method for [updating] a printer linked to a computing device to update microcode of [a] said printer comprising the steps of:

[embedding at least one microcode update as a module in a print job file] receiving from said computing device one or more files across an interface suitable for conveying information to be printed by said printer, wherein at least one of said files is a print job file comprising an embedded microcode module, said module being one of a plurality of modules in said print job file;

[inputting said print job file to said printer, over at least one printer job interface, in a unidirectional fashion, without using any specialized downloading hardware or application routine;]

recognizing [that said] if a received file is a print job file and if a received print job file [includes said] comprises an embedded microcode [update] module, else if a received print-job file does not include a microcode module, then normally processing said print-job file; and

writing [said] at least one microcode [update] module received in a print job file to a memory area in said printer indicated in said print job file.

39. (Currently amended) The method of claim 38, wherein [said step of recognizing includes interrogating a file header of] said print job file further comprises a file header portion and a separate file data portion, and wherein [a] presence of [said] a microcode [update] module in said print job file is indicated by a bit pattern in [a] said file header portion of said print job file [, not in any job data].

40. (Canceled)

41. (Currently amended) The method of claim 38, wherein said step of [inputting] receiving further comprises downloading said module to volatile memory.

42. (Previously presented) The method of claim 38, wherein said step of writing to a memory area further comprises writing to a non-volatile memory area.

43. (Currently amended) The method of claim 38, wherein said microcode [update] module includes an executable program, said executable program being machine language code executable by a processor in said printer.

44. (Previously presented) The method of claim 43, further comprising, after said step of writing, the step of transferring execution to said executable program, without resetting or restarting any processor in said printer.

45. (Currently amended) The method of claim 44, wherein after said step of transferring, said executable program returns execution to a previously running program [that was in existence before said print job file arrived at said printer].

46. (Cancelled)

47. (Previously presented) The method of claim 44, wherein said step of transferring comprises first loading said executable program in to execution memory.

48. (Currently amended) The method of claim 44, wherein after said step of transferring, said executable program acts [as controlling microcode] to download [other modules of said

plurality of modules of] the remainder of said print job file to said printer [, said executable program having been downloaded from said print job file].

49. (Currently amended) The method of claim 48, wherein said step of downloading comprises passing pointers [to said other modules] to said executable program.

50. (Previously presented) The method of claim 38, wherein said module further comprises a module header and module data.

51. (Previously presented) The printer job file of claim 50, wherein said module header comprises a bit pattern that directs a processor in said printer to uncompress said module.

52. (Previously presented) The method of claim 50, wherein said module header comprises a data field for specifying a destination storage location for said module.

53. (Previously presented) The method of claim 52, wherein said module header comprises a bit pattern that directs a processor in said printer to create a file specified by said data field.

54. (Previously presented) The method of claim 52, wherein said module header comprises a bit pattern that directs a processor in said printer to delete a file specified by said data field.

55. (Previously presented) The method of claim 52, wherein said module header comprises a bit pattern that directs a processor in said printer to create a directory specified by said data field.

56. (Previously presented) The method of claim 52, wherein said module header comprises a bit pattern that directs a processor in said printer to delete a directory specified by said data field.

57. (Currently amended) An apparatus for updating microcode comprising;

a computing device [having] comprising a program for composing and downloading a print job file; [said print job file comprising a microcode update; and]

a printer comprising a printer processor, a printer memory [for storing] having stored microcode [and other information], and a printing engine; and

an interface [for sending and receiving information] linking said computing device and said printer and suitable for conveying information to be printed by said printer;

wherein [said processor, said memory, said printing engine, and said interface are coupled together by a bus, and said processor directs the activities of said printing engine and said interface under control of] said program controls causes said computing device

to compose a print job file having an embedded microcode module, and

to download said composed print job file to said printer across said interface, and

wherein said microcode [and further wherein said computing device and said printer are coupled through said interface and said computing device downloads said print job file to said printer over a printer job interface, in a unidirectional fashion, without using any specialized downloading hardware or application routine, said processor recognizes that said print job file includes said microcode update and writes] controls said printer

to receive from said computing device across said interface said print job file comprising an embedded microcode module,

to recognize that said received print job file comprises an embedded microcode module, and

to write said embedded microcode [update] module to a memory area in said printer indicated in said print job file.

58. (Currently amended) The apparatus of claim 57, wherein said print job file further comprises a print job file header and a separate print job file data, wherein [a] presence of a microcode [update] module in said print job file is indicated by a bit pattern in a header portion of said print job file[, not in any job data].

59. (Currently amended) The apparatus of claim 57, wherein said print job file further comprises a module comprising a module header and module body, wherein said module body comprises said microcode [update].

60. (Previously presented) The apparatus of claim 58, wherein said print job file header further comprises a bit pattern that represents an indication of a destination printer.

61. (Currently amended) The apparatus of claim 58, wherein said print job file header further comprises a bit pattern that indicates that said microcode [update includes a module, said] module [including microcode that] is to be immediately executed by said [processor] printer.

62. (Canceled)

63. (Currently amended) The apparatus of claim 61 wherein said print job file comprises a plurality of modules [and] , wherein said print job file header further comprises a bit pattern that indicates that [if] said print job file includes microcode that is to be immediately [executable by said processor] executed, and wherein upon execution said microcode acts [that microcode

executes during a receipt of said print job file, said microcode receives and downloads a rest of said plurality of modules] to download the remainder of said print job to said printer.

64. (Currently amended) The apparatus of claim 59 wherein said module header comprises a bit pattern that directs [a processor in] said printer to uncompress said module.

65. (Previously presented) The apparatus of claim 59 wherein said module header comprises a data field for specifying a destination storage location for said module.

66. (Currently amended) The apparatus of claim 65 wherein said module header comprises a bit pattern that directs [a processor in] said printer to create a file specified by said data field.

67. (Currently amended) The apparatus of claim 65 wherein said module header comprises a bit pattern that directs [a processor in] said printer to delete a file specified by said data field.

68. (Currently amended) The apparatus of claim 65 wherein said module header comprises a bit pattern that directs [a processor in] said printer to create a directory specified by said data field.

69. (Currently amended) The apparatus of claim 65 wherein said module header comprises a bit pattern that directs [a processor in] said printer to delete a directory specified by said data field.

70. (Previously presented) A computer readable medium [carrying one or more sequences of instructions] for updating [a] microcode of a printer from a computing device, [wherein execution of the one or more sequences of] said computer readable medium comprising encoded instructions [by one or more processors causes the one or more processors to perform the steps of] that direct said printer:

[embedding a microcode update as a module in a print job file] to receive from said computing device one or more files across an interface suitable for conveying information to be printed by said printer, wherein at least one of said files is a print job file comprising an embedded microcode module;

[inputting said print job file to said printer, in a unidirectional fashion, without using any specialized downloading hardware or application routine;]

to recognize [that said] if a received file is a print job file and if a received print job file includes said] comprises an embedded microcode [update] module, else if a received print-job file does not include a microcode module, then normally processing said print-job file; and

to write [said] at least one microcode [update] module received in a print job file to a memory area in said printer indicated in said print job file.

71. (Currently amended) The computer readable medium of claim 70, wherein said [microcode update] print job file includes [an executable program] a microcode module that is immediately executable by [a processor in] said printer [, before receiving a rest of said print job file].

72. (Canceled)

73. (Currently amended) The computer readable medium of claim 71 [, further comprising executing said executable program,] wherein said [executable program] microcode

module, upon completion of its immediate execution, returns [execution] to a previously running program [that was in existence before said print job file arrived at said printer].

74. (Currently amended) The computer readable medium of claim 71, wherein said print job file comprises a print job file header portion and a print job file data portion, wherein said print job file data portion further comprises a plurality of modules [and a print job header],

wherein said print job file header [including] portion further comprises a bit pattern indicating whether said print job file includes immediately executable [processor] microcode [; and further comprising executing said executable processor microcode to receive and download a rest of said plurality of modules] that acts to download the remainder of said print job to said printer.

75. (Previously presented) The method of claim 50, wherein said module data is compressible.

76. (New) The method of claim 38 further comprising:

composing a print job file comprising an embedded microcode module; and

sending send composed print job file to said printer from said computing device across an interface suitable for conveying information to be printed by said printer.